

Appendix E

# ***Environmental Justice Project Level Toll Analysis***

Technical Report

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## 1.1 BACKGROUND AND METHODOLOGY

### 1.1.1 Project Background

The US 281 Environmental Impact Statement (EIS) evaluates the impacts of improvements to the US 281 corridor between Loop 1604 and Borgfeld Drive. The corridor is approximately eight miles long and is currently a four lane arterial with at-grade intersections along its length.

Several Build Alternatives were developed for consideration in the EIS, including some that contain a toll component. According to Federal Highway Administration (FHWA) and Texas Department of Transportation (TxDOT) joint guidance<sup>1</sup>, proposed toll facilities must undergo an evaluation to determine anticipated effects on Environmental Justice (EJ) populations within the region, including the impacts to travel time and/or out-of-pocket cost. EJ communities are defined as minority and low-income populations.

The Alamo Area Metropolitan Planning Organization, formerly the San Antonio-Bexar County Metropolitan Planning Organization (MPO) analyzed the effects of the existing and planned network of toll and managed lanes on EJ populations in its *Regional Toll and Managed Lane Analysis* (RTA) (July 2014). Data from this analysis were used to evaluate the effects of the toll component of the US 281 Corridor Project on EJ populations at the project level. According to the RTA, the southern extension of State Highway (SH) 130, from the Guadalupe County line to Seguin, was the only roadway in the MPO's transportation network operating with toll lanes in 2014. The MPO has identified several corridors as planned toll and/or managed facilities by the year 2035, including the northern half of Loop 1604, I-35 east of downtown, I-10 north of Loop 1604, and the US 281 Project Corridor – US 281 north of Loop 1604.

### 1.1.2 Policy Guidelines

This analysis is based on the April 2012 *Amended and Restated Policies and Procedures for Toll Collection Operations on the Alamo RMA Turnpike System* (toll policy).

The toll policy exempts emergency vehicles and military vehicles from paying tolls on the Alamo RMA toll road system. The policy also exempts public transportation vehicles from paying tolls when using the managed lanes operated by the Alamo RMA. Exemptions shall be established on an annual basis between the transit agency and Alamo RMA for use of traditional toll facilities without the managed lane designation by public transportation vehicles. The toll policy exempts registered car pool vehicles with a tag in place only when using the managed lane facility.

The Alamo RMA will use an all-electronic toll collection system without requiring vehicles to stop at toll plazas. Toll tags will be available for users and those without toll tags will be able to elect for video tolling. Such users will see an additional amount, no less than 33 percent but no more than 50 percent of the total fees added to cover the processing costs for each video transaction in addition to a \$1.00 handling fee.

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<sup>1</sup> Federal Highway Administration and Texas Department of Transportation Joint Guidance for Project and Network Level Environmental Justice, Regional Network Land Use, and Air Quality Analyses for Toll Roads, April 23, 2009.



The policy provides for equal access to the Alamo RMA system and agency. The primary website will be in English and Spanish, as well as other languages offered via online based translation programs. Customer service will be provided in the predominant language(s) in the region served by the Alamo RMA. Further details regarding the Alamo RMA toll policy are available on its website at:

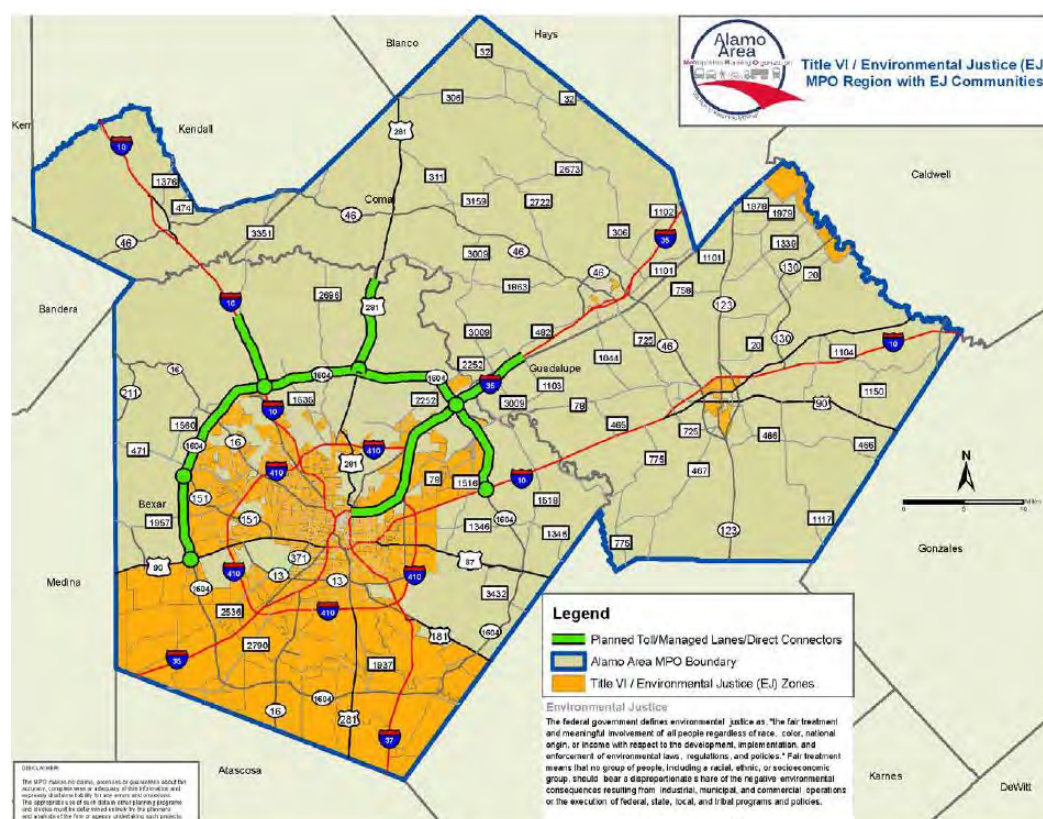
[http://gov.bexar.org/AlamoRMA/docs/ARMA\\_TollPolicies\\_2012-04-12.pdf](http://gov.bexar.org/AlamoRMA/docs/ARMA_TollPolicies_2012-04-12.pdf)

### 1.1.3 Environmental Justice Data

The San Antonio region has a large EJ population. The toll policy and the FHWA/TxDOT guidance recommend a threshold of 50 percent to identify areas with EJ populations. The analysis presented herein is consistent with the 50 percent recommendation. A Traffic Analysis Zone (TAZ) with an EJ population percentage greater than or equal to 50 percent is identified as an EJ zone.

According to the MPO, there are 641 EJ zones in the San Antonio region out of a total of 1,047 TAZs. These EJ zones are projected to contain 1.41 million residents by the year 2035, out of a total regional population of about 2.69 million. The EJ zones are concentrated mostly in the central and southern part of the Bexar County. **Figure E-1** displays the toll/managed facilities planned in the region by 2035 and the EJ zones identified in 2014.

**Figure E-1: Proposed Toll Facilities and Environmental Justice Zones**





#### 1.1.4 Description of Proposed Toll Facility

Two Build Alternatives, the Expressway Alternative and the Elevated Expressway Alternative, and the No-Build Alternative are analyzed in the Final EIS. Both Build Alternatives have variations that include non-toll, toll, or managed lanes. The Preferred Expressway Alternative would include a combination of non-toll general purpose lanes and managed lanes between Loop 1604 and Stone Oak Parkway; whereas the Expressway Alternative – Toll/Managed assumes that all main lanes from Loop 1604 to Borgfeld Drive would be toll or managed lanes and the Expressway Alternative – non-Toll assumes all lanes would be non-toll general purpose lanes.

The project level toll analysis presented herein focuses on the comparison of the No-Build Alternative with the Expressway Alternative – non-Toll and the Expressway Alternative – Toll/Managed. The Expressway Alternative was selected for this analysis because it accommodates more trips through the corridor when compared to the Elevated Expressway Alternative; therefore, it represents the alternative with the greatest potential impact. The findings for the Preferred Expressway Alternative would fall between those presented for Expressway Alternative – non-Toll and the Preferred Expressway Alternative – Toll/Managed.

The following section describes the Build Alternatives analyzed herein.

##### **No-Build Alternative**

The No-Build Alternative is defined in the US 281 EIS as the existing roadway facility (two to three lanes in each direction with at-grade intersections) in combination with all of the committed improvement projects planned by the MPO through 2035 excluding the US 281 Corridor Project. The 2035 network provided by the MPO was used as the basis for the No-Build network. For this analysis, the US 281 Corridor Project was removed from the 2035 network model and US 281 was recoded to the conditions of the roadway in 2008, including the superstreet configuration, to form the No-Build network model.

##### **Expressway Alternative – non-Toll**

The Expressway Alternative – non-Toll includes three non-toll general purpose lanes and three frontage road lanes in each direction through the corridor. The Expressway Alternative – non-Toll was found to attract the greatest demand for US 281 trips.

##### **Expressway Alternative – Toll/Managed**

The Expressway Alternative – Toll/Managed is the same configuration as the Expressway Alternative – Non-toll, but the general purpose lanes are designated as toll/managed lanes. The toll policy for this corridor – including potential accommodations for minority, disabled, or low-income populations – would follow the guidelines outlined in the Alamo RMA's toll policy. The toll guidelines would include policies regarding outreach to minority and disabled communities to allow full access to the toll facility, including websites in Spanish and a customer service number for the hearing disabled population. Toll collection would be conducted with electronic transponders or similar technology. Policies regarding purchases of toll tags by low-income populations are not planned or adopted yet, but would follow guidelines specified in the toll policy.





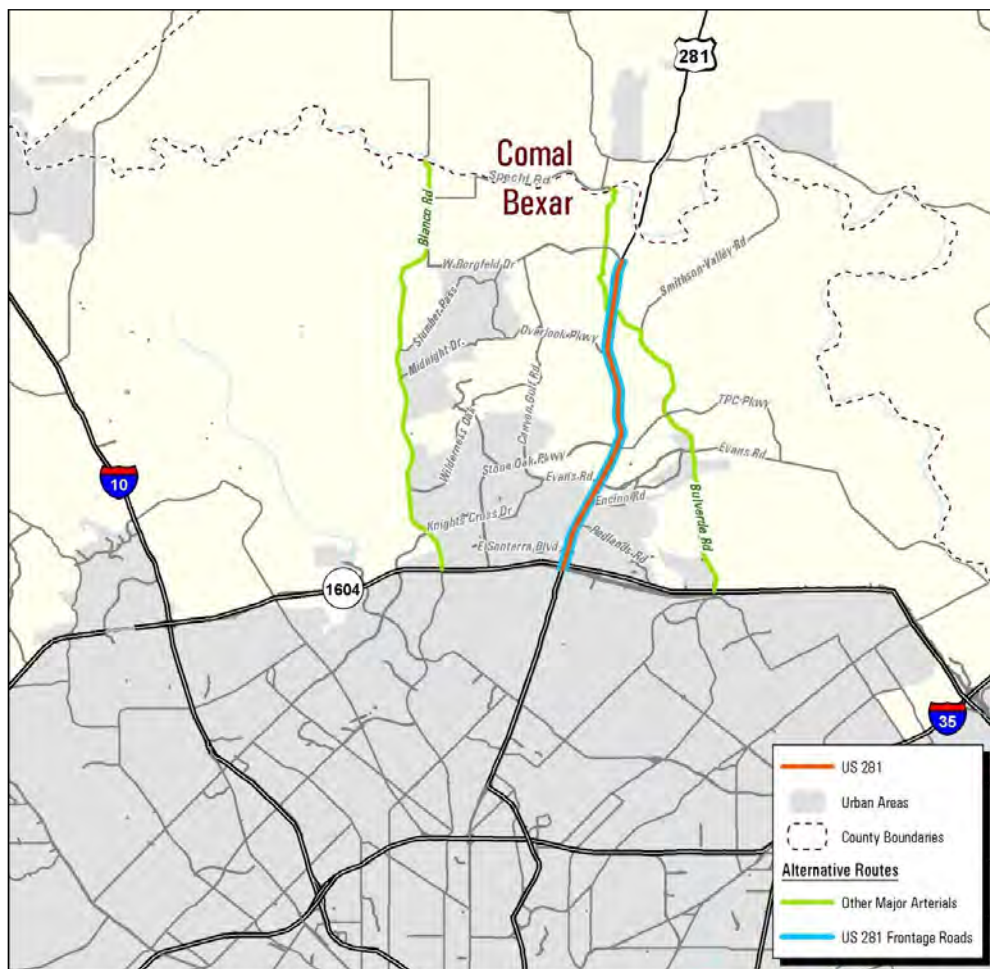
1 For preliminary analysis, toll gantries were assumed to be located:

- 2 1. South of Borgfeld Drive
- 3 2. South of Wilderness Oaks
- 4 3. South of Stone Oak Parkway
- 5 4. South of Encino Rio

### 6 1.1.5 Alternate Routes

7 Alternate routes would be available in the study area to those unable or unwilling to use  
8 the toll facility. First, a non-toll at-grade frontage road system would be constructed  
9 directly adjacent to the toll facility. This system would provide local access along the  
10 corridor as well as access to and from the general purpose lanes or the toll/managed  
11 lanes. In addition to the frontage roads, two primary alternate routes exist in the  
12 vicinity of the project: Bulverde Road to the east and Blanco Road to the west. In 2014,  
13 Blanco Road and Bulverde Road were two-to-four lane and four-to-six lane roadways,  
14 respectively. Blanco Road and Bulverde Road would operate as principal arterials in  
15 most of the study area. These alternate routes are displayed in **Figure E-2**.

16 **Figure E-2: Alternate Routes**



17 Source: US 281 EIS Team, 2011



### 1.1.6 Travel Demand Model

The MPO's 2035 regional travel demand model was used to identify the potential trips that would use the US 281 project corridor and to estimate the travel time impacts on those trips. The MPO adopted *Mobility 2040* on December 8, 2014; however the plan and its associated travel demand model was not available at the time of this analysis. The 2035 travel demand model was the most current data available at the time. The travel demand model provides travel demand volume projections at a daily level. It also produces estimates of trip origins and destinations, as well as congested roadway travel times. The MPO model uses input parameters including speed and travel time based on observed congested – peak hour – conditions. The model assigns trips to roadways under these peak conditions, and reports forecasted peak hour speeds and volume-to-capacity (v/c) ratios, and daily traffic volumes.

As with any simulation model, there are limitations to its capabilities. The model has a basic procedure for estimating toll road volume, which is traffic assignment based. The toll procedure adds a cost in terms of travel time by converting an assumed toll rate per mile with value-of-time assumptions, for links coded as toll links.

For a complete summary of the application of the travel demand model for the US 281 EIS, see **Appendix D2**.

The model was used to determine “candidate” trips for the corridor – these are trips that would use the proposed facility because it would provide the fastest route. These candidate trips were determined by isolating the corridor and identifying trip origin and destination pairs (TAZ's) that use any segment along the corridor. The candidate trips were selected using the Expressway Alternative – non-Toll because it attracts the most travelers on the corridor – it provides increased roadway capacity at no additional cost to the traveler.

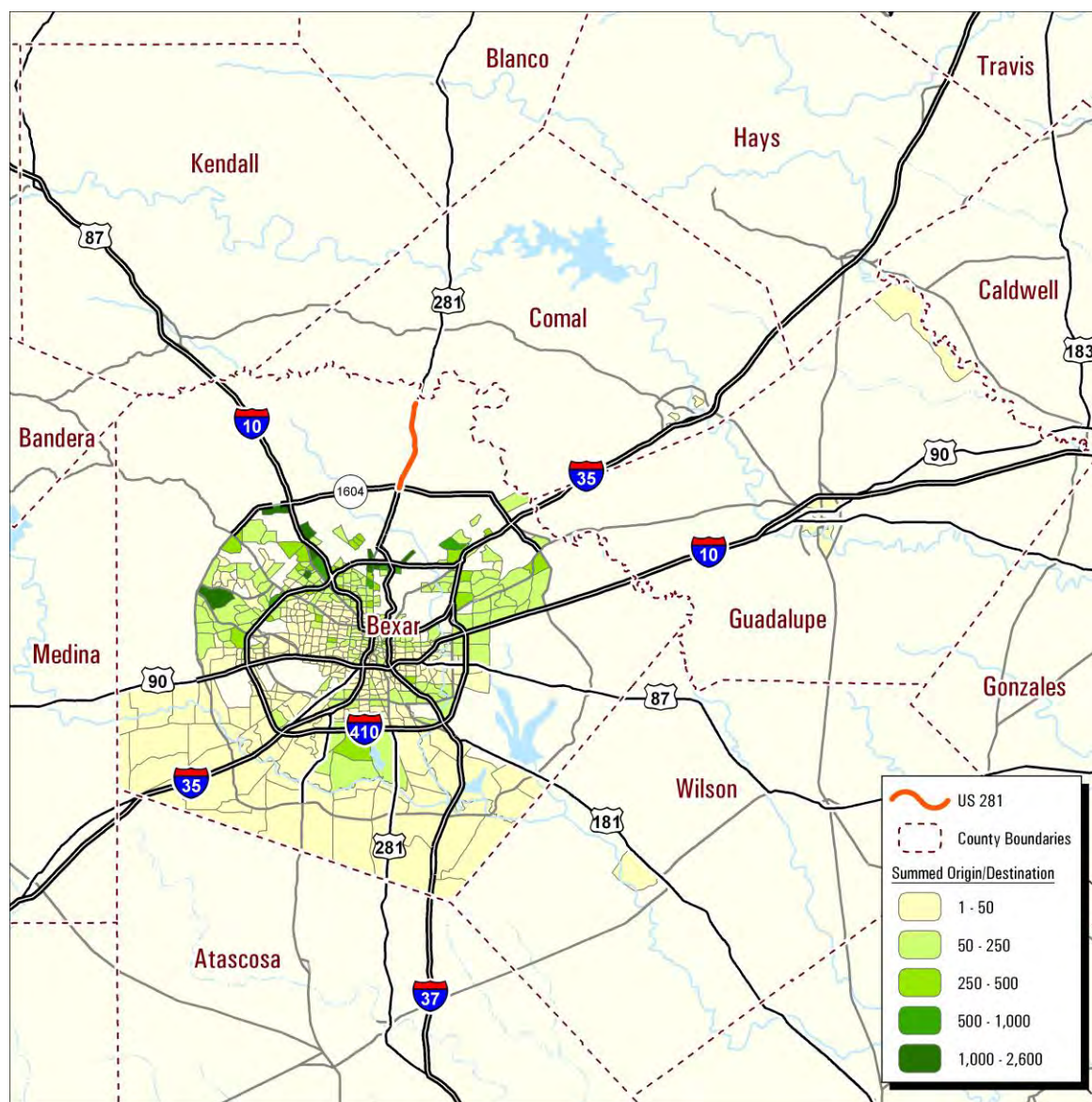
Subsequently, each candidate trip origin-destination (O-D) pair was analyzed to determine the travel time between those TAZ's. This process calculates the congested travel time along the best (shortest time) possible route, and was conducted for the following scenarios:

- 2035 No-Build Alternative
- 2035 Expressway Alternative – non-Toll (general purpose lanes)
- 2035 Expressway Alternative – Toll/Managed (toll/managed lanes)
- 2035 Expressway Alternative – Toll/Managed (alternate routes)

The analysis was conducted using three toll pricing scenarios. According to the Alamo RMA's toll policy, potential toll prices could range between \$0.17 and \$0.50 per mile for the region. Therefore, the analyses were performed with \$0.17, \$0.32, and \$0.50 per mile prices to provide a range of estimated impacts.

## 1.2 RESULTS SUMMARY

Out of estimated 9.2 million daily trips expected in 2035 in the MPO planning region, approximately 211,000 are projected to use the US 281 project corridor. These are considered the candidate trips, and 75,000 of them are projected to either begin or end in an EJ zone. **Figure E-3** presents the EJ zones with trips that use US 281 and the number of trips that begin or end in each zone.

1 **Figure E-3: Environmental Justice Zones that use US 281**

Source: US 281 EIS Team, 2011

### 1.2.1 Travel Time Analysis

The US 281 project corridor is in the northern reaches of the San Antonio region, so trips that use the corridor are generally longer than average for the region, because services and employment opportunities are further away. The average trip distance for all trips in the region is approximately 9 miles, compared to approximately 22 miles for candidate trips. The average trip time in the No-Build Alternative is 97 minutes for all candidate trips, and 106 minutes for EJ candidate trips. Both the Expressway Alternative – non-Toll and the Expressway Alternative – Toll/Managed result in improved travel times for all users including EJ trips. **Table E-1** through **Table E-4** summarizes the changes in travel times for the analysis year of 2035 for the Expressway Alternative – Non-toll and each of the three toll price scenarios. Note that trips that are not identified as candidate trips are slightly impacted (positively) by the inclusion of





either Build Alternative. These are trips that use other roadways in the area that are relieved by the US 281 improvements.

The Expressway Alternative – Non-toll results in an overall decrease in travel time for EJ trips when compared to the No-Build Alternative. Travelers from EJ zones would realize travel time benefits that are similar in magnitude to the travel time benefits of all users. The findings of this analysis are consistent with the findings of the MPO *Regional Toll and Managed Lane Analysis* (July 2014).

In addition, because the Build Alternatives would include frontage road lanes adjacent to the main lanes, the free alternate routes would not result in any greater distance traveled.

**Table E-1: Environmental Justice Analysis – Expressway Alternative – Non-toll**

	Candidate Trips		All Other Trips	
	All	EJ Trips	All	EJ Trips
Number of Trips in 2035	211,200	75,400	8,995,100	5,871,700
No-Build Alternative				
Average Time	97	106	28	26
Expressway Alternative - non-Toll – (general purpose lanes)				
Average Time	83	90	28	26
Time Savings per Trip compared to No-Build (minutes)	14	16	0	0
Total Time Savings compared to No-Build (hours)	50,000	19,500	28,000	7,000

Source: US 281 EIS Team, 2012

As shown above, the Expressway Alternative – non-Toll would result in travel time savings of approximately 14 minutes for all candidate trips and 16 minutes for EJ traveler trips in the corridor.

**Table E-2: Environmental Justice Analysis – 17 Cent Toll**

	Candidate Trips		All Other Trips	
	All	EJ Trips	All	EJ Trips
Number of Trips in 2035	211,200	75,400	8,995,100	5,871,700
No-Build Alternative				
Average Time	97	106	28	26
Expressway Alternative –Toll/Managed (toll/managed lanes)				
Average Time	83	91	28	26
Time Savings per Trip compared to No-Build (minutes)	14	15	0	0
Total Time Savings compared to No-Build (hours)	49,500	18,500	16,000	2,000
Expressway Alternative – Toll/Managed (alternate routes)				
Average Time	89	97	28	26
Time Savings per Trip compared to No-Build (minutes)	8	9	0	0
Total Time Savings compared to No-Build (hours)	29,000	10,500	14,000	1,500

Source: US 281 EIS Team, 2012

As shown in **Table E-2**, travelers willing to pay 17 cents per mile to use the toll/managed lanes would experience a travel time savings of approximately 14 minutes for all candidate trips and 15 minutes for EJ trips. Travelers unwilling or unable to pay the toll



and that use an alternate route would still receive travel time benefits of 8 to 9 minutes compared to the No-Build Alternative. If the toll rate was 32 cents per mile, the travel time savings would be 15 minutes for all candidate trips and 16 minutes for EJ trips on the toll/managed lanes and 7 minutes for all trips on the alternate routes (**Table E-3**).

**Table E-3: Environmental Justice Analysis – 32 Cent Toll**

	Candidate Trips		All Other Trips	
	All	EJ Trips	All	EJ Trips
Number of Trips in 2035	211,200	75,400	8,995,100	5,871,700
No-Build Alternative				
Average Time	97	106	28	26
Expressway Alternative – Toll/Managed (toll/managed lanes)				
Average Time	82	90	28	26
Time Savings per Trip compared to No-Build (minutes)	15	16	0	0
Total Time Savings compared to No-Build (hours)	52,500	19,000	11,500	500
Expressway Alternative – Toll/Managed (alternate routes)				
Average Time	90	99	28	26
Time Savings per Trip compared to No-Build (minutes)	7	7	0	0
Total Time Savings compared to No-Build (hours)	23,500	8,000	8,000	0

Source: US 281 EIS Team, 2012

**Table E-4: Environmental Justice Analysis – 50 Cent Toll**

	Candidate Trips		All Other Trips	
	All	EJ Trips	All	EJ Trips
Number of Trips in 2035	211,200	75,400	8,995,100	5,871,700
No-Build Alternative				
Average Time	97	106	28	26
Expressway Alternative – Toll/Managed (toll/managed lanes)				
Average Time	81	89	28	26
Time Savings per Trip compared to No-Build (minutes)	16	17	0	0
Total Time Savings compared to No-Build (hours)	55,500	20,500	20,000	6,000
Expressway Alternative – Toll/Managed (alternate routes)				
Average Time	93	102	28	26
Time Savings per Trip compared to No-Build (minutes)	4	4	0	0
Total Time Savings compared to No-Build (hours)	15,500	5,000	15,000	5,000

Source: US 281 EIS Team

Travelers willing to pay 50 cents per mile on the toll/managed lanes would experience a travel time savings of approximately 16 to 17 minutes for all candidate trips. Travelers who select an alternate route would still receive travel time benefits of 4 minutes compared to the No-Build Alternative (**Table E-4**).

These results are generally intuitive – as the price of the toll increases, fewer people are willing to pay, which results in less congested toll/managed lanes, improving travel times for those willing to pay a higher rate. Meanwhile, travelers unwilling or unable to pay the toll would divert to alternate routes, resulting in greater congestion and fewer travel time benefits for those travelers. However, regardless of the pricing scenario, or



whether a traveler selects a toll/managed lane or an alternate route, all travelers would benefit from improved travel times under the Build Alternatives, compared to the No-Build Alternative.

The travel time savings resulting from the Preferred Expressway Alternative would be between those reported for the Expressway Alternative – non-Toll and the Expressway Alternative – Toll/Managed. As explained above an EJ traveler would save 16 minutes of travel time on the non-toll general purpose lanes with the Expressway Alternative – non-Toll, when compared to the No-Build Alternative. With the Expressway Alternative – Toll/Managed, an EJ traveler would save between 15 to 17 minutes in travel time if they were to select a toll or managed lane, and 4 to 9 minutes if they were to select a non-toll route, when compared to the No-Build Alternative. The travel time savings afforded from the Preferred Expressway Alternative for EJ trips are comparable with those expected for all travelers. As such, all motorists, EJ and non-EJ alike, stand to benefit from the creation of new capacity whether or not tolls are used to finance the improvements.

### 1.2.2 Cost Analysis

The Alamo RMA's toll policies contain tolling prices ranging from \$0.17 per mile to \$0.50 per mile. The upper and lower values of this range, as well as a mid-range (\$0.32 per mile) were analyzed. **Table E-5** presents potential toll changes for users under each of these tolling scenarios, based on median household incomes for households living within the region.

**Table E-5: Toll Cost Summary**

Toll Cost per mile	Daily Round Trip Cost	Yearly Cost <sup>2</sup>	Percent of Median Household Income		
			Bexar County (\$49,141) <sup>3</sup>	Comal County (\$63,480) <sup>4</sup>	Poverty Line (\$19,790) <sup>5</sup>
\$0.17	\$2.72	\$680	1.4%	1.1%	3.4%
\$0.32	\$5.12	\$1,280	2.6%	2.0%	6.5%
\$0.50	\$8.00	\$2,000	4.1%	3.2%	10.1%

Source: MPO Traffic Model, 2009, US 281 EIS Team, 2014.

While EJ populations may spend a greater portion of their income on tolls, as shown in **Section 1.1.4**, the at-grade non-toll frontage road lanes would provide improved travel times when compared to the No-Build Alternative, and would provide a net benefit to EJ and non-EJ communities.

<sup>2</sup> Assumes use of the tolled/managed lanes along the entire US 281 project corridor, at a frequency of 5 rounds trips per week for 50 weeks out of the year.

<sup>3</sup> US Census Bureau, 2008-2012 American Community Survey, Median Household Income in the Past 12 Months (2012 Inflation-adjusted Dollars).

<sup>4</sup> US Census Bureau, 2008-2012 American Community Survey, Median Household Income in the Past 12 Months (2012 Inflation-adjusted Dollars).

<sup>5</sup> US Department of Health and Human Services 2014 Poverty Guidelines for a 3-person household (2014 Dollars).



- 1 There were no low-income populations identified within the study corridor and because
- 2 the project would enhance the overall functionality and mobility of the existing non-toll
- 3 transportation network, which includes the frontage road lanes, as well as any future
- 4 transit service, it is anticipated that low-income travelers would not experience a
- 5 disproportionately high and adverse human health and environmental effect as a result
- 6 of the Build Alternatives, including the Preferred Expressway Alternative.